Semi-annual Progress Report for
Alaska Regional Observation System Coordination
NOAA Award NA05NOS4731097
December 1, 2005 – May 31, 2006

Prepared by Molly McCammon, AOOS Executive Director
June 30, 2006

1.0 Progress on Regional Association Development

This progress report briefly describes activities carried out in support of developing the Alaska Ocean Observing System (AOOS) and follows the format provided by the NOAA Coastal Services Center and Ocean.US. With additional funding support AOOS has met or made substantial progress toward the goals, objectives and milestones in the grant application for NOAA Award NA05NOS4731097.

1.1 Actions taken to date

1.1.1. Stakeholder and user needs identification and engagement

- Formal and informal contacts continue to be made with potential AOOS users/stakeholders in order to identify user needs and interests in AOOS. These efforts however, have been scaled back because sufficient IOOS funding has still not been included in federal budgets to support significant regional observing systems. We are now in a period of "expectation management."
- The following presentations and briefings were given during this reporting period:
    - A special session on AOOS at the Alaska Marine Science Symposium in January 2006 with featured talks on modeling, database development, the AOOS web pages, and the Prince William Sound demonstration project.
    - Two presentations at the Alaska Forum on the Environment in February 2006: one given by Dr. Carl Schoch in the climate change session and another on the PWS pilot project and AOOS website during the stakeholder sessions with links to three remote sites: Whittier, Valdez and Cordova.
    - Presentation in the ocean observing session at the AGU/ASLO Ocean Sciences meeting in Honolulu in February 2006.
    - Presentation and meetings with stakeholders during January through May in Southeast Alaska and Cook Inlet to build consensus and develop implementation plans.
    - Presentations to the Science Panel and Advisory Panel of the North Pacific Research Board.
    - Presentation by Carl Schoch at The Coastal Society meeting in St. Petersburg, FL.
    - Presentation to the Science Committee of the Oil Spill Recovery Institute, the major funding contributor for the Prince William Sound demonstration project.

- AOOS sponsored, and the Barrow Arctic Science Consortium (BASC) hosted, a user needs workshop for the North Slope whaling community in Barrow (February 7-8, 2006). Approximately 15 people attended the two-day session; a report has been prepared and posted on the AOOS website. The workshop was chaired by BASC chair Richard Glenn and attended by the NSB mayor Edward Itta. AOOS science leader Dr. Mark Johnson spoke twice on public radio about AOOS and its potential for Arctic residents.
- AOOS hosted a workshop in Anchorage (April 12 , 2006) with the North Slope oil and gas industry to discuss industry observing needs that could be addressed by both AOOS and the proposed Barrow Cabled Observatory. The workshop was co-sponsored by the North Slope Borough, Arctic Regional Corporation, Barrow Arctic Science Consortium, and the Minerals Management Service. About 35 people attended. A report of that workshop is posted on the AOOS website.

1.1.2. Governance and administrative structure

- The AOOS Governance Committee met on November 21-22, 2005.
- No progress has been made at the national level regarding Federal participation on regional association boards. Language has been included in IOOS authorization legislation, currently pending in the U.S. House of Representatives, to clarify that federal agency representatives can participate on RA boards. The State of Alaska submitted a letter to AOOS describing their concerns about the governance structure of AOOS, and indicating that they would await passage of the IOOS authorizing legislation before formalizing their concerns.
- AOOS continues to actively participate in national IOOS planning efforts, including those of the National Federation of Regional Associations (NFRA). Molly McCammon is currently co-chair of NFRA and meets frequently with Ocean.US staff, IOOS federal agencies, and other regional associations to further the development of IOOS.
- McCammon continues to work with AOOS members and others to seek multiple and alternate sources of funding for AOOS, including the submission of numerous proposals to other funding agencies.

1.1.3. Business/operations Plan

- Components of the AOOS business/operations plan continue to be developed: DMAC, education & outreach, stakeholder involvement, integration of existing assets, and plans for observing systems in Alaska's three major sub-regions: Arctic, Bering Sea/Aleutian Islands and Gulf of Alaska (via workshops, stakeholder outreach, strategic planning, and then development of implementation plans).
- When the implementation plans for the three sub-regions are drafted later this year, their costs will be developed and plans for long-term sustainability will be explored.

1.1.4. Data Management and Communications Subsystem

- AOOS Data Management and Communications Committee met in Anchorage January 27, 2006.
- AOOS DMAC is seeking to develop Alaska as a national data site, given the state's size, length of coastline, and geographic location.

- The DMAC team has developed metadata templates consistent with IOOS guidelines to incorporate on-line hydrographic, current meter mooring, ADCP, and other oceanographic data.
- A MapServer interface has been developed and is in-place for AOOS web pages for data serving.
- Data archival and retrieval are in-place for the PWS Field Experiment for 2007.
- A mirror site has been set up at the University of Alaska Experimental Forecast Facility. Their RAMS model data are acquired and on display.
- A "master station list" has been developed to monitor and automatically interrogate and download all real-time data within the Alaska. Data streams from NWS/NOAA are arriving at 60GB per day.
- Physical and biological data are now accessible through collaborations with OBIS and ARCOD for seamless data sharing.
- Satellite data (GOES, MODIS, AVHRR) are now available on line with a data feed of nearly 2 TB per month.
- Model data from FNOC, RAMS, Navy NOGAPS, and SWAN are being processed and made available. Model validation of RAMS and NOGAPS is well underway.
- A prototype "end to end" system is complete with physical, biological, satellite, and model data being accessed and displayed.
- Web cam displays from a suite of sites around the state have been set up and account for almost 20% of AOOS web site "hits".
- A custom "North Slope" page has been set up with displays of sea ice data from the National Centers.
- A proposal has been submitted to NASA to process and display SAR sea-ice data along the North Slope from Kaktovik to Nome, Alaska. This is a direct response to user needs based on the Barrow Workshop mentioned above.
- A proposal to NSF has been submitted, with some financial support from AOOS, to measure sea-ice thickness along the North Slope. Additional support is being sought from the private sector.
- Hardware for data archival, processing and storage has been purchased.
- Lab/office space at the University of Alaska Fairbanks has been acquired to house DMAC and the Data Analysis group.
- The AOOS web page has developed prototype data access for the Prince William Sound Pilot Project for both marine and atmospheric data. The data team is working on improving "access" and "ease of use" for AOOS stakeholders.
- A user feedback and response questionnaire has been developed and is available on line.

1.1.5. Education, outreach and public awareness activities

- A contract with Alaska Sea Grant's Marine Advisory Program has been negotiated to provide outreach and public awareness activities, beginning with the Prince William Sound pilot project, and then for potential AOOS website users.
- The AOOS promotional brochure, prepared by the Alaska Sea Grant Program, received a Gold Award for design from the Association for Communication Excellence with a perfect score for both editorial quality and graphic design.

- The revised AOOS website went live in late January 2006. New data sets and information products continue to be added to this site.
- McCammon presented at Coastal Erosion Responses workshop, January 4, 2006.
- IOOS and Public Health Workshop in St. Petersburg, FL included two Alaska participants: Alaska Sea Grant aquaculture specialist Ray RaLonde representing AOOS, and state of Alaska Division of Environmental Health director Kristin Ryan, with travel costs underwritten by AOOS.
- Carl Schoch presented on AOOS at The Coastal Society conference in St. Petersburg, FL, May 14, 2006.
- McCammon participated in the COSEE (Centers for Ocean Sciences Education Excellence) networking and strategy workshop in Washington DC in March 2006.
- AOOS partner Dana Sitzler, Alaska SeaLife Center, presented at the Ocean Literacy conference in Washington DC in June 2006.
- McCammon presented on AOOS and NFRA at the Ocean Research and Resources Advisory Panel meeting in Washington in January 2006.
- McCammon participated in the Ocean Research Priorities Plan workshop in Denver April 18-20, 2006.

1.1.6. Regional Coastal Ocean Observing System Activities – planning and integrating a comprehensive system

- **Statewide:** The draft Strategic Plan was revised following the November 2005 AOOS Governance Committee meeting and circulated to the AOOS email list for comment. Comments on the draft plan suggest the need to define better the transition from research to operations, and clarify the evolution of AOOS modeling. Significant coordination and collaboration is occurring among the federal agencies working in Alaska as a result of the national IOOS initiative.
- **Arctic:** AOOS continued to actively participate in the National Research Council's Committee to Develop an Arctic Observing Network of which McCammon is a committee member. The committee's report was finalized and released to the public in May 2006. Other activities include:
    - North Slope whaling captains workshop in Barrow in February, 2006.
    - Oil and gas needs workshop in Anchorage April 12, 2006.
    - Installation of the Barrow web cam and sea-ice radar.
    - Development of "North Slope" web page with satellite sea ice concentration data.
    - Proposal to the National Science Foundation to acquire sea-ice thickness measurements in response to the North Slope whaling captains workshop.
    - Proposal to NASA to acquire radarsat S(AR) sea ice data in response to the North Slope whaling captains workshop.
- **Bering Sea/Aleutian Islands:** Mark Johnson and Tom Weingartner have been participating with a planning group developing an integrated Bering Sea Ecosystem plan. Other activities include:
    - One time support of current meter moorings in Bering Strait, including deployment of nutrient sensors. This is support during expected transition to NOAA/NSF long-term funding. Data provide key information at this "choke point".

- Support for moorings at Amukta Pass provides key data on transport through this key passage in the Aleutian chain.

- **Gulf of Alaska:** Carl Schoch is now devoting 25% of his time as GOA coordinator for AOOS. The focus continues on the Prince William Sound pilot project, as well as furthering the preliminary efforts in Cook Inlet, the outer Kenai Coast, Kodiak, and Southeast. The report from the 2005 Cook Inlet Physical Oceanography workshop was finalized and posted on the AOOS website. Other activities include:
  - Cook Inlet implementation plan: a new implementation plan was drafted by a consortium of stakeholders in Cook Inlet and Kodiak and this document will continue to be refined over the next few months.
  - Southeast Alaska implementation plan: a new implementation plan was drafted by the NOAA Auke Bay Lab in Southeast Alaska. This document represents the needs of a diverse group of stakeholders and will continue to be refined over the next few months.
  - Prince William Sound pilot project: This is a five year effort to demonstrate the utility of ocean observing system products to coastal communities of boaters, aviators, mariculture industries, maritime transportation industries, and the oil spill response community.
    - PWS moorings: Oceanographic moorings were deployed in the major entrances of PWS in the fall of 2005. Three of the five were successfully recovered and the data downloaded in May 2006. Two of the five are being redesigned to better withstand the high velocity currents of the passes.
    - NDBC buoy upgrades: The center at Stennis Space Center is designing a new buoy for deployment in Montague Strait, and in July 2006 will repair the ocean instruments on two of three buoys in PWS. The third buoy will be upgraded in 2007 with instruments purchased by the Prince William Sound Science Center.
    - NRCS weather stations: There are six new telemetered weather stations deployed in PWS, and three more are scheduled for deployment in the summer of 2006: Copper Delta, Valdez, and Mt Doran. Two more are scheduled for deployment in 2007: Naked Island and Jackpot Bay.
    - USGS stream gauge: A new gauge has been deployed on the Copper River to measure this significant source of freshwater to PWS. Telemetry equipment was installed in May 2006 and the gauge is now streaming data to the UAF data archive.
    - Salinity surveys: A small fishing boat was outfitted with a thermosalinograph and now conducts monthly cruise through PWS to measure the surface layer salinity, temperature, turbidity, and chlorophyll fluorescence. Maps of these parameters will be made and posted on the web site.
    - HF radar: The radar units in PWS have not been operating reliably due to problems with the autonomous power supply and telemetry issues. This deployment is being redesigned and will not be re-serviced due to budgetary constraints following the next power outage. The current

emphasis is to focus on a successful operation during the Prince William Sound field experiment in summer of 2007.

- Web cams: The web cam images are the most frequently visited web page on the AOOS site. There are now 14 cameras around the perimeter of PWS delivering images in 15 minute intervals. Images are archived at UAF.
- ROMS model: The ocean circulation model is being developed by UCLA and NASA JPL and is in the second of a three year effort. The third and last year will include a data assimilation component and a nitrate/phytoplankton/zooplankton component.
- SWAN model: the wave model is operational at Texas A&M University and is waiting on upgraded bathymetry for improving the forecast and spatial resolution of model output.
- RAMS model: the atmospheric circulation model is operational at the University of Alaska Anchorage and is undergoing rigorous validation using the new array of observation platforms.
- Field experiment: A major field trial is being planned for summer 2007 and an organizational meeting will be held in Seattle on October 11-12, 2006. All the principals will attend to provide an update on progress made to date on the various component of the PWS demonstration project and to plan the field experiments.
- Funding proposals: AOOS PIs have a grant from NASA to develop decision support tools for the PWS oil spill response community. Proposals were submitted to extend this grant but budget cuts at NASA eliminated the program. A pre-proposal has been submitted to the Coastal Response Research Center to fund a coordinator for the 2007 field trial.

1.2 Results of the activities

- Our activities have resulted in an exponential increase in web page usage with an average of over 300 visits per days and over 10Mb of data downloaded per month.
- A broader appreciation for the utility of AOOS has resulted from the web page exposure and the numerous presentations made to local, regional, and national stakeholders. For example the US Coast Guard is routinely accessing the web page for data, and the local communities are providing more feedback on web page elements. Substantial downloading is also being done by the private sector.
- Progress is being made on all fronts: Stakeholder/users Engagement, DMAC, Education and Outreach, Business/Operations Plan, RCOOS activities and Governance and Administration.

1.3 Plans for the next year

1.3.1. Stakeholder/user needs identification and engagement new

- Continue with approach to three Alaska regions and sub-regions based on Large Marine Ecosystem (LME) concept.

- Reassess the makeup of the AOOS Governance Committee and development of stakeholder advisory committees to ensure adequate stakeholder representation and communication.
- Work with Resource Development Council on future industry forum.
- Continue developing the newly formed Sea Ice Working Group.
- Convene a workshop to develop Alaska priorities in preparation for the national satellite remote sensing workshop.
- Convene a workshop to help develop an Alaska COSEE proposal.
- Work with Alaska Sea Grant to further user product development from Prince William Sound pilot project.
- Initiate a teleconference work session between AOOS and the Pacific Ocean Observing System – a NOAA Fisheries effort to develop an ecosystem observing system for the California Coastal Current.
- Participate in coastal erosion and coastal climatology planning efforts with the National Weather Service, NOAA climate office, and others, including field trip to Bristol Bay.
- Collaborate with North Pacific Research Board in meetings in Bering Sea coastal villages.

1.3.2. Governance and administrative structure

- Reconvene the AOOS Governance Options Subcommittee to review governance options in light of the evolution of AOOS, IOOS and other Regional Associations. Finalize new MOA once the federal participation issue is resolved. Have signed by multiple federal, state, private, academic, tribal partners. Remove term "governance" since it seems to be causing concerns among state agencies, and clarify that AOOS is not a policy-governance entity. Continue to work with the State of Alaska on attending, if not joining, the AOOS Governance process.
- Develop set of operating procedures for AOOS board and committees to use.
- Consider need for 501 (c) (3) corporation, and if so, conduct legal work.
- Develop approach for stakeholder/user committee (e.g., 1 statewide committee or regional committees, committee mission and terms of reference).

1.3.3. Business/operations plan

- All of the components described above (Governance, DMAC, education & outreach, stakeholder engagement, and coastal observing system activities) are in progress. The AOOS business/operations plan will integrate these efforts.
- A draft plan is expected to be released for review and comment in early 2007.

1.3.4. DMAC activities

- DMAC employs three full time personnel. Additional personnel are needed to address new needs such as acquiring fisheries data from agency databases, expansion of data mining, improving the "look and feel" of the AOOS web page, and analysis of model results.
- Finalize AOOS DMAC plan.
- Convene DMAC Committee in fall 2006 to review efforts to date and provide input into DMAC development plan.

- Continue to participate in IOOS DMAC activities, including expert teams.
- Start development of the Alaska Marine Information System in collaboration with the North Pacific Research Board.
- Clarify the role of the Modeling and Analysis Group and the transition of the JPL modeling effort to AOOS. At present funding levels, this transition is not possible, and solutions are likely related to IOOS modeling plans at the National level.

1.3.5. Education, outreach and public awareness activities

- Hire education coordinator to begin implementation of education plan.
- Work with Alaska Sea Grant Marine Advisory Program to develop outreach & public awareness plan, as part of AOOS business/implementation plan.
- Develop collaboration for proposed Alaska COSEE.

1.3.6. Regional Coastal Ocean Observing System Implementation Activities

- Statewide: Strategic plan has been revised per AOOS Governance Committee comments and other public comments solicited prior to its June 2006 meeting. The Strategic Plan is expected to be further revised based on this feedback and is expected to be approved by the AOOS Governance Committee at the December 2006 meeting together with the three subregional or RCOOS implementation plans now under development.
- Arctic RCOOS: AOOS will be collaborating with a number of IPY efforts. The National Research Council's new report on establishing an Arctic Observing Network (McCammon served as a member on the NRC committee) has just been released, and efforts to establish an Arctic GOOS are underway. McCammon and Mark Johnson (UAF) are following-up with results from the Barrow workshop by developing approaches to providing the sea-ice information products that were requested, including proposals for additional funding to meet stakeholder needs.
- Bering Sea/Aleutian Islands RCOOS: Continue to participate with NOAA, NPRB, USGS, and NSF on BSAI integrated research plans. Determine information needs for Aleutian ecosystem management pilot project. Work with the Bristol Bay and Norton Sound CDQ groups on future workshops on needs for coastal ocean observing in these areas
- Gulf of Alaska RCOOS: Continue work on draft strategy for greater Gulf of Alaska. Continue with pilot efforts in PWS, including follow-up to stakeholder/user and biological component workshop. Develop Cook Inlet observing system plan. Begin Southeast and Kodiak/Shelikof plan.

2.0 Issues, Challenges and Opportunities

Many of these are past challenges and issues that still continue.

- Additional and stable funding is critical. Funds are needed to develop AOOS programs and enable them to grow. The regions need to know that there will be guaranteed funding because without longer-term support, AOOS hiring to build the necessary knowledge and technical bases is severely compromised. Because of its size and remoteness, Alaska faces infrastructure and geographic challenges that require substantial funding to solve problems such as power, communication, and transportation that simply do not exist in other regions. (For example, colleagues in CA speak of the hardship of driving "in traffic" for 2 hours to service one of their HF radar observing sites. In

contrast, in Alaska, most sites can only be accessed by small planes or boats.) Simply maintaining the existing backbone programs requires more funding. With base funding being delayed (now until FY 08 at the earliest), it is very difficult to develop and sustain stakeholder interest and support.

- The State of Alaska is still not an active participant in the AOOS Governance efforts. One of the major concerns appears to be with the focus on "governance" in IOOS planning documents and that this may lead to AOOS involvement in policy and ocean governance issues. We are hoping to resolve this issue this year.
- Continued ambiguity in what constitutes the national backbone and what is part of regional system. Are PORTS part of backbone or RCOOS? This affects how we present budget needs and information, especially to Congress, and how the regions relate to the backbone programs.
- Database management – without detailed guidance from IOOS regarding database development, metadata, and web page tools to disseminate the data, our progress is delayed, or what may be worse for the long term, we are proceeding forward in the absence of that guidance.
- Federal agencies must still get the message about coordination and integration. The message needs to come from the top as well as from the bottom. Several agencies have been identified to brief about AOOS activities: EPA, Department of Energy, Department of Homeland Security (other than Coast Guard and specifically FEMA).
- The National Federation of Regional Associations is being looked to in order to provide coordinated regional input to national IOOS. The organization needs to get funded, organized and operational.
- Federal agencies need to be full voting partners on the governing boards of all the regional associations. Affiliate, or ex-officio membership, is not adequate.
- Opportunities for Alaska: Potential funding for a new RISA effort (NOAA's Regional Integrated Science and Assessment Program) anticipated for Alaska. Collaboration with PICES MONITOR Committee and North Pacific Ecosystem Status Report for Pacific Basin efforts. Collaboration with Pacific OOSs on basin-wide modeling, information products, and data systems. Collaboration with a potential NEON effort in Alaska. The International Polar Year offers some opportunities for Arctic observing activities. A major collaboration on coastal erosion and developing coastal climatologies among all the federal and state agencies and the University of Alaska (and with partners in the Pacific Islands) is underway. NOAA, the state, and the North Pacific Fisheries Management Council are developing an ecosystem forum with a pilot effort in the Aleutians that could provide opportunities for AOOS to provide information and data support.